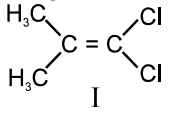
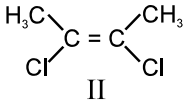
Exercise-1

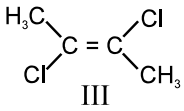
PART - I : ONLY ONE OPTION CORRECT TYPE

Section (A) : Dipole Moment

A-1. Arrange the following in decreasing order of dipole moments.


I

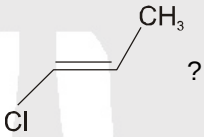

II

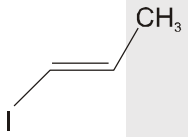
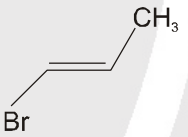
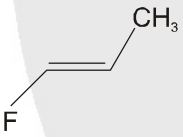
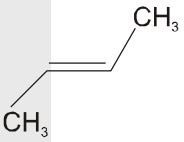

III

(A) I > II > III (B) III > II > I (C) III > I > II (D) II > I > III

A-2. Dipole moment is shown by :
(A) 1,4-Dichlorobenzene (B) Trans-1-chloroprop-1-ene
(C) E-1,2-Dibromoethene (D) $CH_2=C=CH_2$

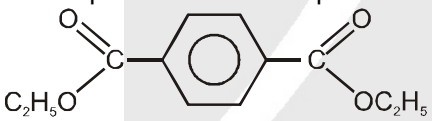
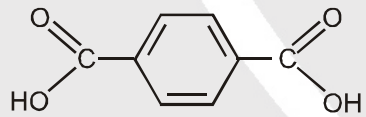
A-3. Which will have highest dipole moment ?
(A) CH_3–F (B) CH_3–Cl (C) CH_3–Br (D) CH_3–I

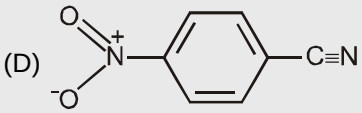
A-4. Which will have higher dipole moment than  ?

(A)  (B)  (C)  (D) 

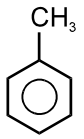
A-5. False statement about dipole moment is :
(A) Dipole moment is a vector quantity.
(B) Dipole moment depends on charge.
(C) Geometrical isomers have same dipole moment.
(D) Mirror image isomers have same dipole moment.

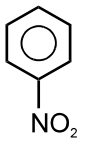
A-6. Which compound have zero dipole moment ?

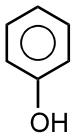
(A)  (B) 

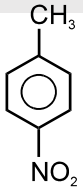
(C)  (D) 

A-7. The increasing order of dipole moment of following compounds is :


1

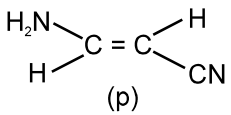

2

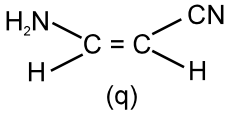

3

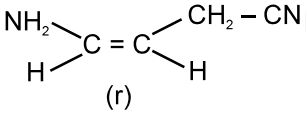

4

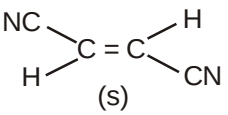
(A) 3 < 1 < 4 < 2 (B) 1 < 4 < 3 < 2 (C) 1 < 3 < 4 < 2 (D) 1 < 3 < 2 < 4

A-8. The correct order of dipole moment is :


(p)

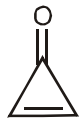
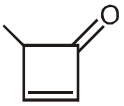
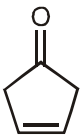
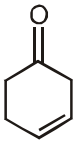

(q)

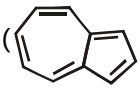

(r)

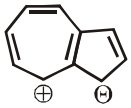

(s)

(A) p > r > q > s (B) q > p > r > s (C) r > s > q > p (D) p > q > r > s

A-9. Which compound have maximum dipole moment ?

(A)  (B)  (C)  (D) 

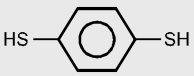
A-10. Azulene () has dipole moment 0.8 D because

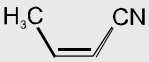
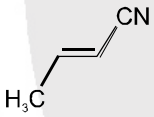
(A) It exists as aromatic compound  in which both the rings are aromatic.

(B) Charge separation permits conformational stability.
(C) The two rings are of different size.
(D) The molecules obey (4n + 2) Huckel rule.

A-11. Which of the following compounds posses highest dipole moment.
(A) Naphthalene (B) Phenanthrene (C) Anthracene (D) Azulene

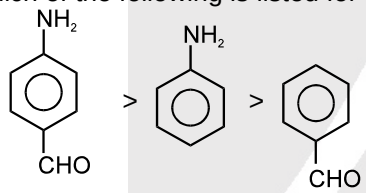
A-12. Which statement is incorrrect ?

(A) Dipole moment of  is non zero.

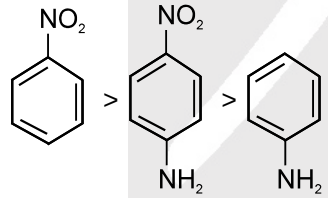
(B) Melting point of  is less than that of  .

(C) Benzene, naphthalene and anthracene can be separated by water.
(D) Aniline and phenol can be separated by common acid HCl

A-13. Which of the following is listed for correct order of polarities :

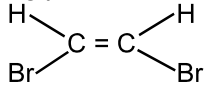
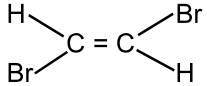
(A) 

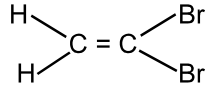
(B) $\underset{\text{(trans)}}{CH_3-CH=CH-NO_2} > \underset{\text{(cis)}}{CH_3CH=CH-NO_2}$

(C) 

(D) $CH_3–CH_3 > CH_3–CH_2–Cl$

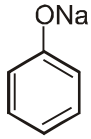
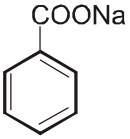
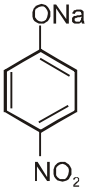
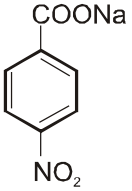
A-14. Which of the following isomers having molecular formula $C_2H_2Br_2$ has highest dipole moment and boiling point but lowest melting point.

(A)  (B) 

(C) 

(D) Not applicable to any single isomer

A-15. Which compound have maximum dipole moment ?

(A)  (B)  (C)  (D) 

A-16. Glycerol is purified by :
(A) steam distillation (B) vacuum distillation
(C) fractional distillation (D) simple distillation

A-17. Two immiscible liquids are separated by :
(A) separating funnel (B) fractional distillation
(C) chromatrography (D) sublimation

A-18. Sublimation is a process in which a solid :
(A) changes into another allotropic form
(B) changes into liquid form
(C) changes into vapour form directly from solid form
(D) none of the above

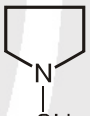
Section (B) : Boiling point

B-1. (I) 1,2-dihydroxy benzene (II) 1,3-dihydroxy benzene
(III) 1,4-dihydroxy benzene (IV) Hydroxy benzene
The increasing order of boiling points of above mentioned alochols is
(A) I < II < III < IV (B) I < II < IV < III (C) IV < I < II < III (D) IV < II < I < III

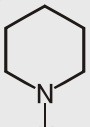
B-2. Arrange the following in decreasing order of their boiling points.

(w)

(x)



(y)

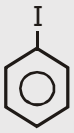


(z)

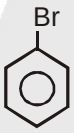
(A) w > x > z > y (B) w > x > y > z (C) w > z > y > x (D) w > z > x > y

B-3. The correct boiling point order is :

1



2



3

4

(A) 4 > 1 > 3 > 2 (B) 2 > 3 > 1 > 4 (C) 1 > 2 > 3 > 4 (D) 2 > 4 > 1 > 3

B-4. Correct boiling point order for I to IV is :
CH_3F (I) CH_3Br (II) CH_3Cl (III) CH_3I (IV)
(A) I > II > III > IV (B) IV > III > II > I (C) II > IV > I > III (D) IV > II > III > I

B-5. Which property of organic compound decreases boiling point.
(A) Increase in length of hydrocarbon chain (B) Increase in intermolecular H-bonding
(C) Increase in molecular weight (D) Increase in branching

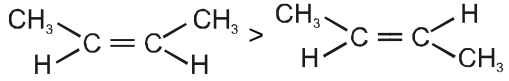
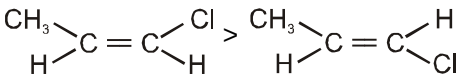
B-6. Decreasing order of boiling point of I to IV follow
Methylformate (I) Ethylformate (II) Iso-propylformate (III) n-propylformate (IV)
(A) I > II > III > IV (B) III > IV > II > I (C) IV > III > II > I (D) I > II > IV > III

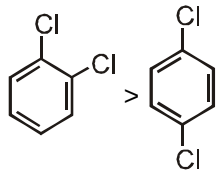
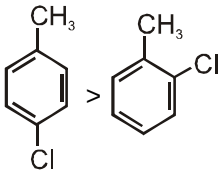
Section (C) : Melting Point

C-1. Which compound has highest melting point ?
(A) o-Dibromobenzene (B) m-Dibromobenzene
(C) p-Dibromobenzene (D) Bromobenzene

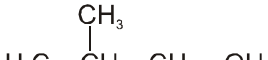
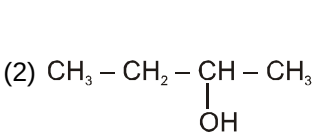
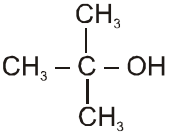
C-2. Which will have highest melting point?
(A) orthohydroxyphenol (B) metahydroxyphenol
(C) parahydroxyphenol (D) paramethylphenol

C-3. Which order is correct regarding melting point ?

(A)  (B) 

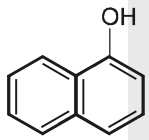
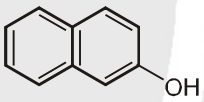
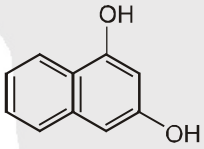
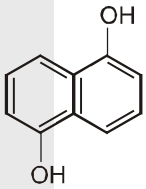
(C)  (D) 

C-4. Identify the correct order of melting point of the following compounds

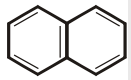
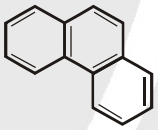
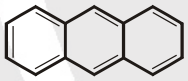
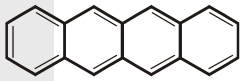
(1)  (2)  (3) 

(A) 3 > 1 > 2 (B) 3 > 2 > 1 (C) 1 > 2 > 3 (D) 2 > 1 > 3

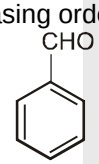
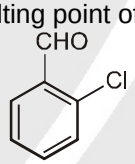
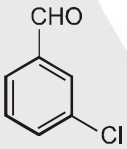
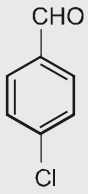
C-5. Which will have highest melting point ?

(A)  (B)  (C)  (D) 

C-6. Which of the following compounds have highest melting point ?

(A)  (B)  (C)  (D) 

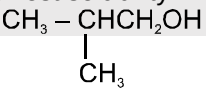
C-7. Decreasing order of melting point of compound I - IV follows :

 I  II  III  IV

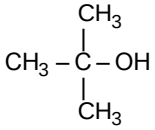
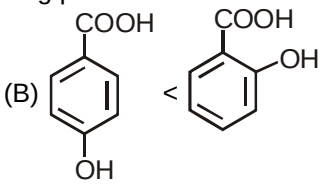
(A) IV > III > II > I (B) I > II > III > IV (C) II > III > IV > I (D) II > IV > III > I

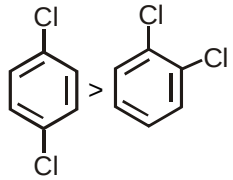
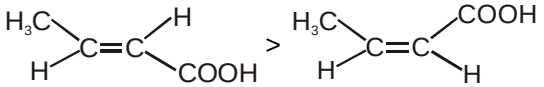
Section (D) : Solubility in water

D-1. Which of the following has lowest solubility in water ?

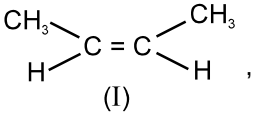
(A) $CH_3CH_2CH_2OH$ (B)  (C) $HOCH_2–CH_2OH$ (D) $C_6H_5CH_2CH_2OH$

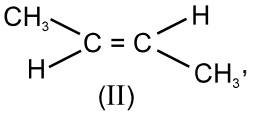
D-2. Correct water solubility order/s amongst the following pairs is/are :

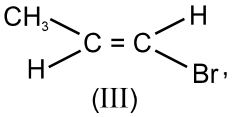
(A) $CH_3–CH_2–CH_2–CH_2–OH$ >  (B) 

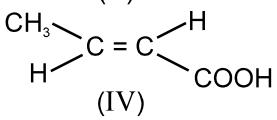
(C)  (D) 

D-3. Arrange the following in decreasing order of their solubility in water


(I)

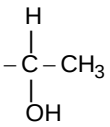
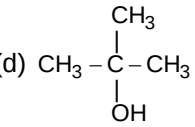

(II)


(III)


(IV)

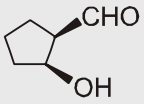
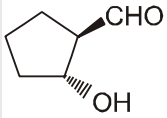
(A) III > I > II > IV (B) III > IV > I > II (C) IV > III > I > II (D) IV > III > II > I

D-4. The correct order of solubility in water is :

(a) CH_3OH (b) CH_3CH_2OH (c)  (d) 

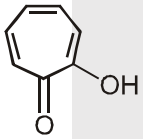
(A) a > b > c > d (B) b > a > c > d (C) d > a > b > c (D) b > c > a > d

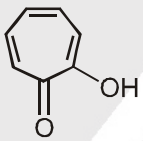
D-5. Which have maximum solubility in water, for nearly same molecular weight compounds ?
(A) Alkane (B) Alkene (C) Alcohol (D) Ether

D-6. In which case first has higher solubility than second ?
(I) Phenol, Benzene (II) Nitrobenzene, Phenol
(III) o-Hydroxybenzaldehyde, p-Hydroxy benzaldehyde (IV) CH_3CHO, $CH_3–O–CH_3$
(V) o-Nitrophenol, p–Nitrophenol (VI)  

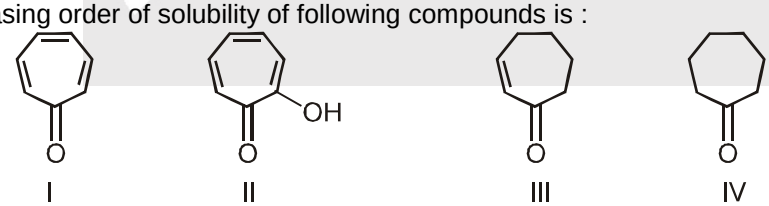
(A) only I (B) III, V (C) I, IV (D) I, IV, VI

D-7. Which of the following statement is correct about tropolone?



(A) Solubility of  (tropolone) is less than  (tropone).
(B) Tropolone has more stability and aromatic character than tropone.
(C) Tropolone has higher dipole moment than tropone.
(D) Tropolone has lower boiling point than tropone.

D-8. Decreasing order of solubility of following compounds is :

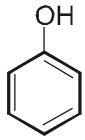
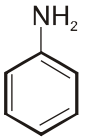
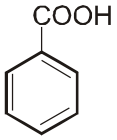
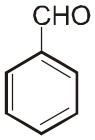

I II III IV

(A) I > II > III > IV (B) II > I > III > IV (C) II > III > I > IV (D) IV > III > II > I

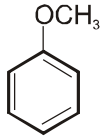
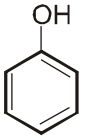
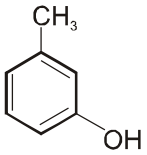
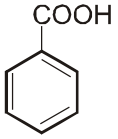
D-9. Which carboxylic acid has maximum solubility in water ?
(A) Malonic acid (B) Succinic acid (C) Salicylic acid (D) Phthalic acid

Section (E) : POC-II

E-1. Which of the following compounds form salt with HCl ?

(A)  (B)  (C)  (D) 

E-2. Which of the following compounds does not form salt with NaOH ?

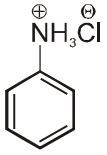
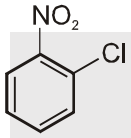
(A)  (B)  (C)  (D) 

E-3. The blood red colour in the combination test of nitrogen and sulphur in organic compound is due to the formation of :

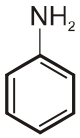
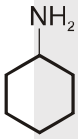
(A) ferric sulpho cyanide (B) ferric acetate
(C) ferrous sulpho cyanide (D) ferric cyanide

E-4. In Lassaigne's test, the organic compound is fused with sodium metal as to :

(A) hydrolyse the compound
(B) form a sodium derivative
(C) convert nitrogen, sulphur or halogens if present into soluble ionic sodium compound
(D) burn the compound

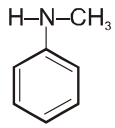
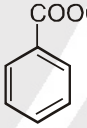
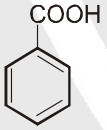
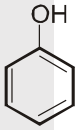
E-5.  and  can be differentiated by :

(A) Ammonical $AgNO_3$ (B) Fehling solution (C) $FeCl_3$ (D) Br_2 / H_2O

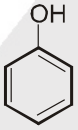
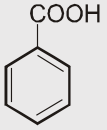
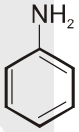
E-6.  and  can be differentiated by :

(A) $NaHCO_3$ (B) $CHCl_3$ and KOH
(C) $NaNO_2$, HCl then β-napthol (D) NaOH

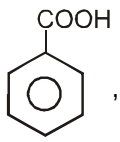
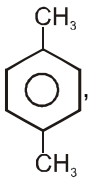
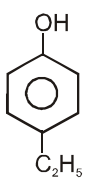
E-7. Which of the following compounds form salt with $NaHCO_3$?

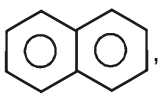
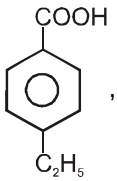
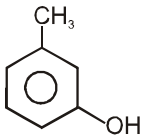
(A)  (B)  (C)  (D) 

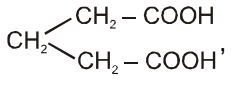
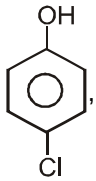
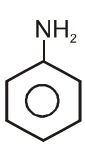
E-8. Which of the following compound cannot form salt with H_2O, $NaHCO_3$, NaOH and HCl ?

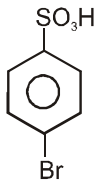
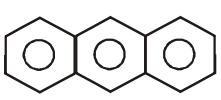
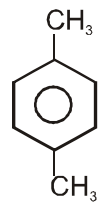
(A)  (B)  (C)  (D) 

E-9. When the mixture of [A + B + C] is dissolved in $NaHCO_3$, A dissolves in $NaHCO_3$, B & C remain as a residue after that residue dissolves in aq. NaOH, C dissolves in it and B remains as residue. A, B and C will be respectively.

(A)  ,  , 

(B)  ,  , 

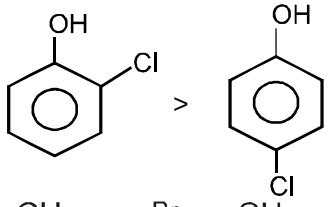
(C)  ,  , 

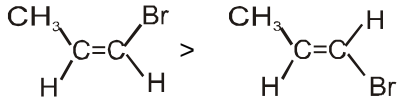
(D)  ,  , 

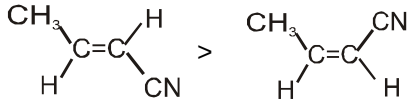
PART - II : ONE OR MORE THAN ONE OPTIONS CORRECT TYPE

1. In which of the following case/cases, is/are the order of indicated property correctly shown ?

(A) $CH_3CH=CHCHO > CH_3CHO$ (Dipole Moment)

(B)  (Boiling Point)

(C)  (Solubility)

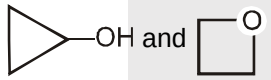
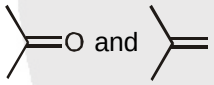
(D)  (Dipole Moment)

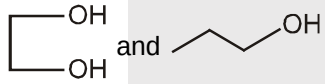
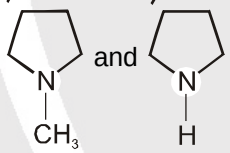
2. Which of the following has/have dipole moment of first compound greater than the dipole moment of second compound ?

(A) NaCl and HCl (B) $CFCl_3$ and $CHCl_3$

(C) $CH_3–NO_2$ and CH_3NH_2 (D) HF and BF_3

3. In which case second has lower boiling point than first ?

(A)  (B) 

(C)  (D) 

4. A water insoluble solid mixture of organic compounds containing p-Toluic acid, p-Toludine and naphthalene can be separated by using the sequence of reagents.

(A) $\xrightarrow[(1)]{\text{aq. NaCl}} \xrightarrow[(2)]{\text{aq. HCl}}$ (B) $\xrightarrow[(1)]{\text{aq. NaHCO}_3} \xrightarrow[(2)]{\text{aq. HCl}}$

(C) $\xrightarrow[(1)]{\text{aq. HCl}} \xrightarrow[(2)]{\text{aq. NaHCO}_3}$ (D) $\xrightarrow[(1)]{\text{aq. CH}_3\text{COOH}} \xrightarrow[(2)]{\text{aq. NH}_4\text{Cl}}$

PART - III : COMPREHENSION

Read the following passage carefully and answer the questions.

Comprehension # 1

The boiling point of a liquid is the temperature where its kinetic energy is sufficient to overcome the intermolecular attractive forces.

Boiling point depends on following :

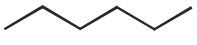
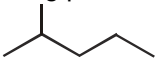
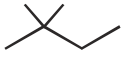
(a) Intermolecular H-bonding. (b) Molecular weight.

(c) Dipole-dipole attraction. (d) Strength of vander Waal's forces.

1. Which will have maximum boiling point ?

(A) $\begin{matrix}CH_2-OH\\|\\CH_2-OH\end{matrix}$ (B) $\begin{matrix}CH_2-O-CH_3\\|\\CH_2-OH\end{matrix}$ (C) $\begin{matrix}CH_2-O-CH_3\\|\\CH_2-O-CH_3\end{matrix}$ (D) $\begin{matrix}O-CH_3\\|\\CH_2-O-CH_3\end{matrix}$

2. Which will have maximum boiling point ?

(A)  (B)  (C)  (D) 

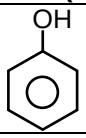
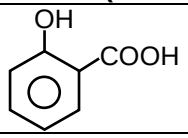
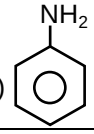
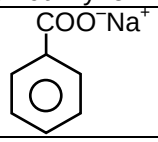
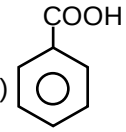
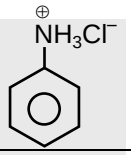
3. Which will have maximum boiling point ?

(A) $CH_3–Cl$ (B) CH_2Cl_2 (C) $CHCl_3$ (D) CCl_4

Comprehension # 2

Q.4, Q.5 and Q.6 by appropriately matching the information given in the three columns of the following table.

Physical properties of the compounds affected by many facters like H-bond, dipole moment, vander walls forces etc.

Column 1 (Reactant)	**Column 2 (Reagent)**	**Column 3 (Product)**
(I) 	(i) Na, NH_3 (ℓ)	(P) 
(II) $CH_3–C\equiv C–CH_3$	(ii) NaOH, CO_2, H^+	(Q) But-2-yne
(III) 	(iii) $NaHCO_3$ (aq)	(R) 
(IV) 	(iv) $HCl_{(aq)}$	(S) 

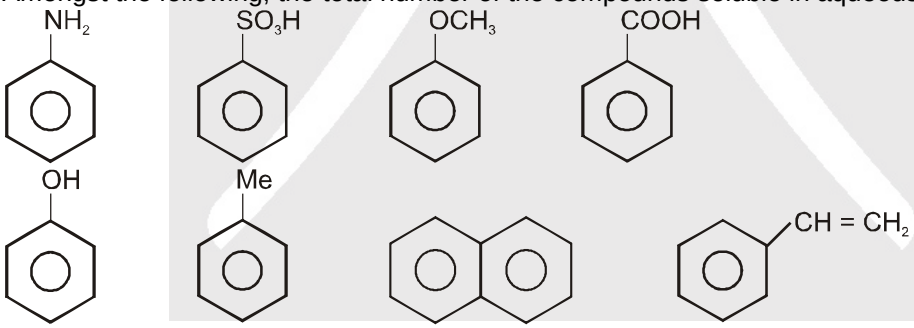
4. Sequence of the reaction, in which both reactant and product have zero dipole moment ?
(A) (I) (ii) (P) (B) (II) (i) (Q) (C) (III) (ii) (P) (D) (II) (i) (P)

5. The only correct combination in which salt is soluble ?
(A) (I) (ii) (P) (B) (III) (iii) (S) (C) (III) (iv) (S) (D) (IV) (iv) (R)

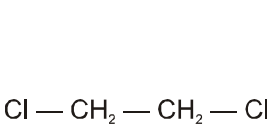
6. In which reaction series product have interamolecular H-bonding and used in the formation of Aspirin?
(A) (I) (ii) (P) (B) (I) (ii) (R) (C) (III) (iv) (S) (D) (I) (i) (P)

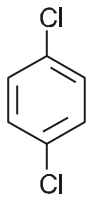
PART - IV : SINGLE AND DOUBLE VALUE INTEGER TYPE

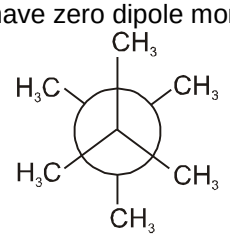
1. Amongst the following, the total number of the compounds soluble in aqueous NaOH is

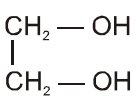


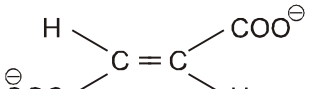
2. How many of the following compounds have zero dipole moment.


(i)

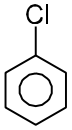

(ii)


(iii)

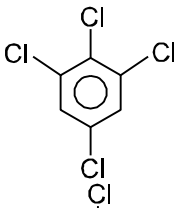

(iv)

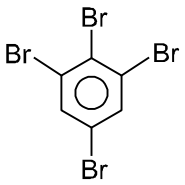

(v)

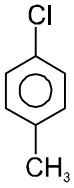
3. How many molecules of the following have non zero dipole moment ?

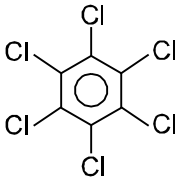
(i) 

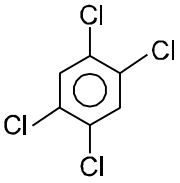
(ii) 

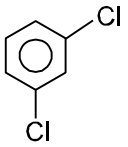
(iii) 

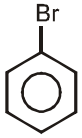
(iv) 

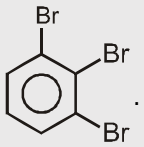
(v) 

(vi) 

(vii) 

(viii) 

4. Considering benzene to be a planar symmetrical hexagon, if the dipole moment of 

is 2D, find the dipole moment (in D) of 

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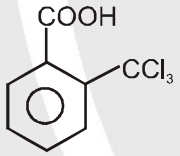
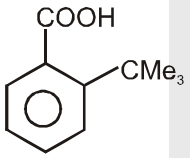
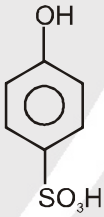
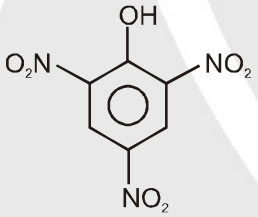
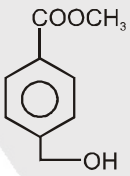
5. How many acids (given below) react with $NaHCO_3$ and liberate CO_2 ?

$CCl_3 - COOH$ $CCl_3 - CH_2 - OH$ 



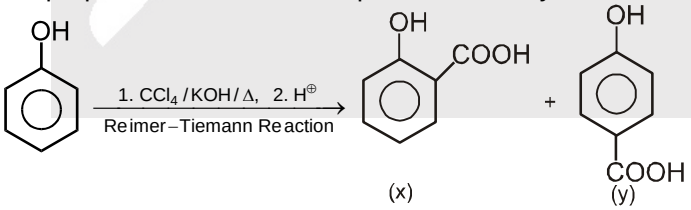






PART - V : MATCH THE COLUMN

1. Compare the properties of two isomeric products x and y formed in the following reaction.



Match the following :

(A)	Dipole moment	(p)	X > Y
(B)	H_2O solubility	(q)	Y = X
(C)	Boiling point	(r)	Y > X
(D)	Melting point	(s)	Can't say

Exercise-2

*** Marked Questions may have more than one correct option.**

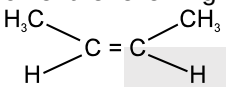
PART - I : JEE (ADVANCED) / IIT-JEE PROBLEMS (PREVIOUS YEARS)

1. Amongst H_2O, H_2S, H_2Se and H_2Te the one with highest boiling point is : **[IIT-JEE 2000, 1/35]**
(A) H_2O because of H-bonding. (B) H_2Te because of higher molecular weight.
(C) H_2S because of H-bonding. (D) H_2Se because of lower molecular weight.

2. Identify the correct order of boiling points of the following compounds : **[IIT-JEE 2002, 3/90]**

$\underset{1}{CH_3CH_2CH_2CH_2OH}$ $\underset{2}{CH_3CH_2CH_2CHO}$ $\underset{3}{CH_3CH_2CH_2COOH}$

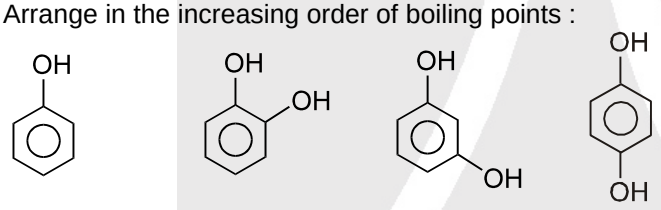
(A) 1 > 2 > 3 (B) 3 > 1 > 2 (C) 1 > 3 > 2 (D) 3 > 2 > 1

3. Which of the following hydrocarbons has the lowest dipole moment : **[IIT-JEE 2002, 3/90]**
(A)  (B) $CH_3C{\equiv}CCH_3$ (C) $CH_3CH_2C{\equiv}CH$ (D) $CH_2{=}CH{-}C{\equiv}CH$

4. Among the following the molecule with the highest dipole moment is : **[IIT-JEE 2003, 3/84]**
(A) CH_3Cl (B) CH_3Cl_2 (C) $CHCl_3$ (D) CCl_4

5. There is a solution of p-hydroxy benzoic acid and p-amino benzoic acid. Discuss one method by which we can separate them and also write down the confirmatory test of the functional groups present. **[IIT-JEE 2003, 4/60]**

6. Arrange in the increasing order of boiling points :



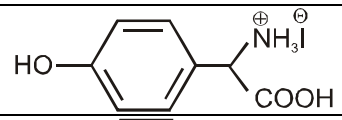
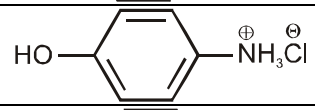
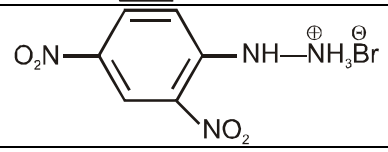
I II III IV **[IIT-JEE 2006, 3/184]**
(A) I < II < III < IV (B) I < II < IV < III (C) IV < I < II < III (D) IV < II < I < III

7. **Statement-1 :** p-Hydroxybenzoic acid has a lower boiling point than o-hydroxybenzoic acid.
Statement-2 : o-Hydroxybenzoic acid has intramolecular hydrogen bonding. **[IIT-JEE-2007, 3/162]**
(A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
(C) Statement-1 is True, Statement-2 is False.
(D) Statement-1 is False, Statement-2 is True.

8. **Statement-1 :** Aniline on reaction with $NaNO_2$ / HCl at 0ºC followed by coupling with β-naphthol gives a dark blue precipitate. **[IIT-JEE 2008,3/163]**
Statement-2 : The colour of the compound formed in the reaction of aniline with $NaNO_2$/HCl at 0ºC followed by coupling with β-naphthol is due to the extended conjugation.
(A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
(C) Statement-1 is True, Statement-2 is False
(D) Statement-1 is False, Statement-2 is True

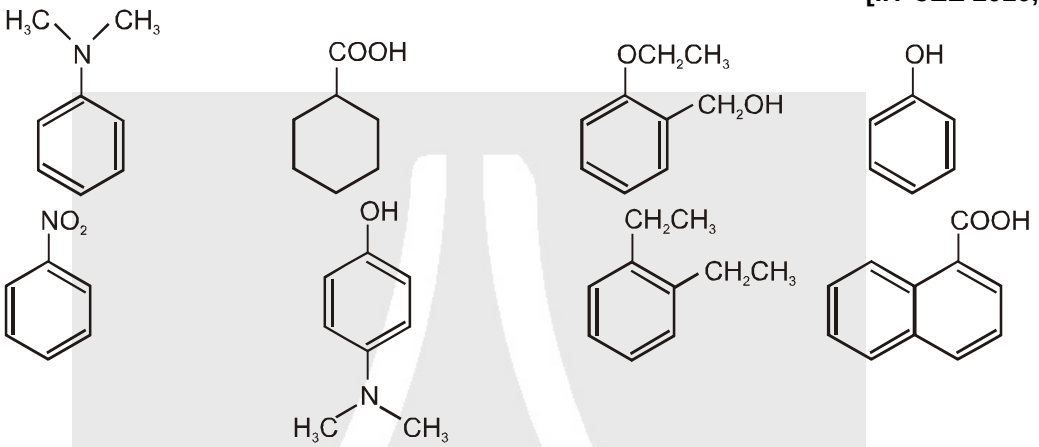
9. Match the entries in **Column I** with the correctly related quantum number(s) in **Column II.** **[IIT-JEE 2008, 6/163]**

	Column I		**Column II**
(A)	$H_2N{-}\overset{\oplus}{N}H_3\,\overset{\ominus}{Cl}$	(p)	sodium fusion extract of the compound gives prussian blue colour with $FeSO_4$

(B)		(q)	gives positive $FeCl_3$ test
(C)		(r)	gives white precipitate with $AgNO_3$
(D)		(s)	reacts with aldehydes to form the corresponding hydrazone derivative

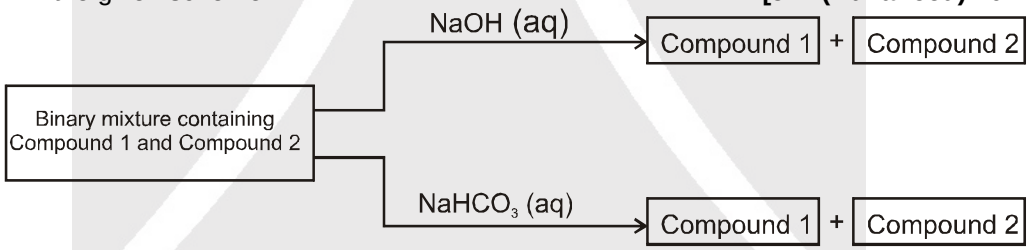
10. Amongst the following, the total number of compounds soluble in aqueous NaOH is :

[IIT-JEE 2010, 3/184]



11.* Identify the binary mixture(s) that can be separated into individual compounds, by differential extraction, as shown in the given scheme.

[JEE(Advanced) 2012, 4/136]



(A) C_6H_5OH and C_6H_5COOH
(B) C_6H_5COOH and $C_6H_5CH_2OH$
(C) $C_6H_5CH_2OH$ and C_6H_5OH
(D) $C_6H_5CH_2OH$ and $C_6H_5CH_2COOH$

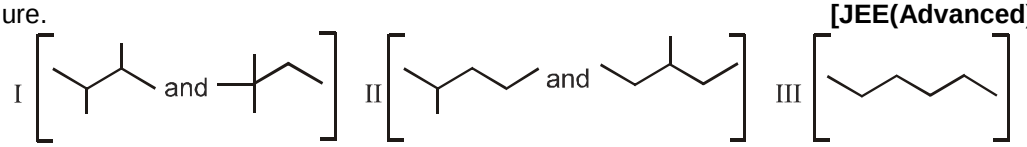
12. The compound that does **NOT** liberate CO_2, on treatment with aqueous sodium bicarbonate solution, is

[JEE(Advanced) 2013, 2/120]

(A) Benzoic acid
(B) Benzenesulphonic acid
(C) Salicylic acid
(D) Carbolic acid (Phenol)

13. Isomers of hexane, based on their branching, can be divided into three distinct classes as shown in the figure.

[JEE(Advanced) 2014, 3/120]



The correct order of their boiling point is

(A) I > II > III
(B) III > II > I
(C) II > III > I
(D) III > I > II

PART - II : JEE (MAIN) / AIEEE PROBLEMS (PREVIOUS YEARS)

JEE(MAIN) OFFLINE PROBLEMS

1. Which of the following statements is true? **[AIEEE - 2002, 3/225]**
(1) HF is less polar than HBr
(2) absolutely pure water does not contain any ions
(3) chemical bond formation takes place when forces of attraction overcome the forces fo repulsion
(4) in covalency transference of electron takes place.

2. An ether is more volatile than an alcohol having the same molecular formula. This is due to - **[AIEEE - 2003, 3/225]**
(1) Dipolar character of ethers
(2) Alcohols having resonance structures
(3) Inter-molecular hydrogen bonding in ethers
(4) Inter-molecular hydrogen bonding in alcohols

3. Which of the following pairs of molecules will have permanent dipole moments for both members ? **[AIEEE - 2003, 3/225]**
(1) SiF_4 and NO_2 (2) NO_2 and CO_2 (3) NO_2 and O_3 (4) SiF_4 and CO_2

4. The compound formed in the positive test for nitrogen with the Lassaigne solution of an organic compound is - **[AIEEE - 2004, 3/225]**
(1) $Fe_4[Fe(CN)_6]_3$ (2) $Na_3[Fe(CN)_6$ (3) $Fe(CN)_3$ (4) $Na_4[Fe(CN)_5NOS]$

5. Which one of the following has the minimum boiling point ? **[AIEEE - 2004, 3/225]**
(1) n-butane (2) 1-butyne (3) 1-butene (4) Isobutene

6. Which one of the following method is neither meant for the synthesis nor for separation of amines ? **[AIEEE-2005, 3/225]**
(1) Hinsberg method (2) Hofmann method
(3) Wurtz reaction (4) Curtius reaction

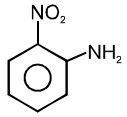
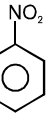
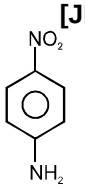
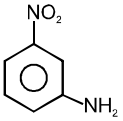
7. Among the following mixtures, dipole-dipole as the major interaction, is present in **[AIEEE-2006, 3/165]**
(1) benzene and ethanol (2) acetonitrile and acetone
(3) KCl and water (4) benzene and carbon tetrachloride

8. Which of the following reagents may be used to distinguish between phenol and benzoic acid ? **[AIEEE-2011, 4/120]**
(1) Aqueous NaOH (2) Tollen's reagent (3) Molisch reagent (4) Neutral $FeCl_3$

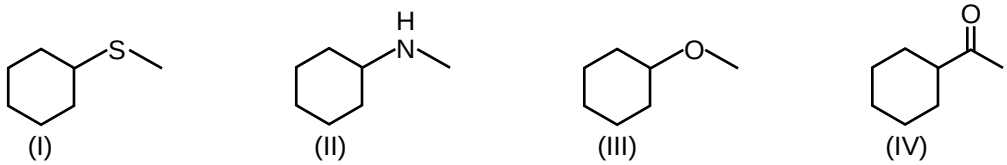
9. Ortho-Nitrophenol is less soluble in water than p- and m- Nitrophenols because : **[AIEEE-2012, 4/120]**
(1) o-Nitrophenol is more volatile steam than those of m- and p-isomers.
(2) o-Nitrophenol shows Intramolecular H-bonding
(3) o-Nitrophenol shows intermolecular H-bonding
(4) Melting point of o-Nitrophenol is lower than those of m- and p-isomers.

JEE(MAIN) ONLINE PROBLEMS

1. Which is the major product formed when acetone is heated with iodine and potassium hydroxide ? **[JEE(Main) 2014 Online (09-04-14), 4/120]**
(1) Iodoacetone (2) Acetic acid (3) Iodoform (4) Acetophenone

2. Which compound exhibits maximum dipole moment among the following ? **[JEE(Main) 2015 Online (11-04-15), 4/120]**
(1) 
(2) 
(3) 
(4) 

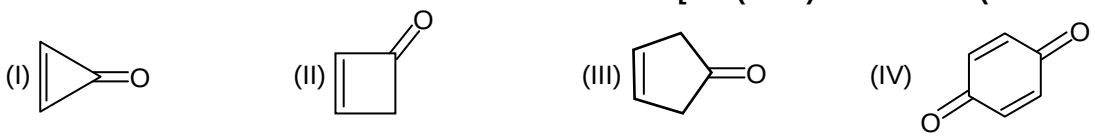
3. A mixture containing the following four compounds is extracted with 1M HCl. The compound that goes to aqueous layer is : **[JEE(Main) 2017 Online (08-04-15), 4/120]**



(I) (II) (III) (IV)

(1) (II) (2) (IV) (3) (I) (4) (III)

4. Which of the following compounds will show highest dipole moment ? **[JEE(Main) 2017 Online (09-04-17), 4/120]**



(I) (II) (III) (IV)

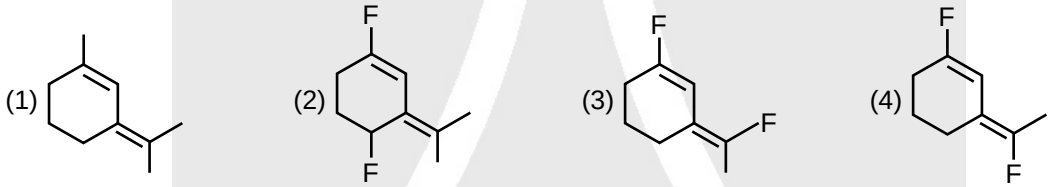
(1) (I) (2) (III) (3) (II) (4) (VI)

5. The increasing order of the boiling points for the following compounds is : **[JEE(Main) 2017 Online (09-04-17), 4/120]**

C_2H_5OH (I) C_2H_5Cl (II) $C_2H_5CH_3$ (III) $C_2H_5OCH_3$ (IV)

(1) (IV) < (III) < (I) < (II)
(2) (III) < (II) < (I) < (IV)
(3) (II) < (III) < (IV) < (I)
(4) (III) < (IV) < (II) < (I)

6. The most polar compound among the following is : **[JEE(Main) 2018 Online (16-04-18), 4/120]**

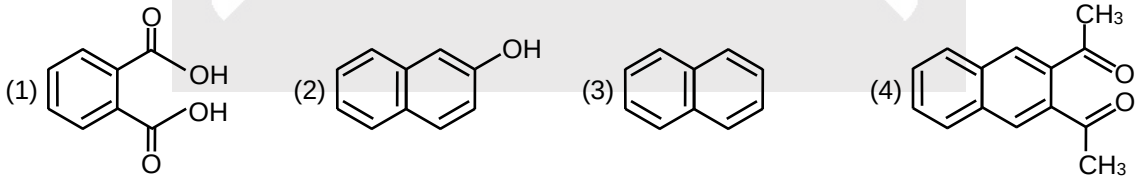


(1) (2) (3) (4)

7. If dichloromethane (DCM) and water (H_2O) are used for differential extraction, which one of the following statements is correct ? **[JEE(Main) 2019 Online (10-01-19), 4/120]**

(1) DCM and H_2O will make turbid/colloidal mixture
(2) DCM and H_2O will be miscible clearly
(3) DCM and H_2O would stay as lower and upper layer respectively in the separating funnel (S.F.)
(4) DCM and H_2O would stay as upper and lower layer respectively in the separating funnel (S.F.)

8. Among the following four aromatic compounds, which one will have the lowest melting point ? **[JEE(Main) 2019 Online (12-01-19), 4/120]**



(1) (2) (3) (4)

Answers

EXERCISE – 1

PART – I

A-1.	(A)	**A-2.**	(B)	**A-3.**	(B)	**A-4.**	(C)	**A-5.**	(C)
A-6.	(C)	**A-7.**	(D)	**A-8.**	(D)	**A-9.**	(A)	**A-10.**	(A)
A-11.	(D)	**A-12.**	(C)	**A-13.**	(B)	**A-14.**	(C)	**A-15.**	(C)
A-16.	(B)	**A-17.**	(A)	**A-18.**	(C)	**B-1.**	(C)	**B-2.**	(D)
B-3.	(B)	**B-4.**	(D)	**B-5.**	(D)	**B-6.**	(C)	**C-1.**	(C)
C-2.	(C)	**C-3.**	(D)	**C-4.**	(A)	**C-5.**	(D)	**C-6.**	(D)
C-7.	(A)	**D-1.**	(D)	**D-2.**	(D)	**D-3.**	(C)	**D-4.**	(A)
D-5.	(C)	**D-6.**	(C)	**D-7.**	(B)	**D-8.**	(B)	**D-9.**	(A)
E-1.	(B)	**E-2.**	(A)	**E-3.**	(A)	**E-4.**	(C)	**E-5.**	(A)
E-6.	(C)	**E-7.**	(C)	**E-8.**	(A)	**E-9.**	(A)		

PART – II

1.	(AD)	**2.**	(ACD)	**3.**	(ABC)	**4.**	(BC)

PART – III

1.	(A)	**2.**	(A)	**3.**	(D)	**4.**	(B)	**5.**	(C)
6.	(A)								

PART - IV

1.	3	**2.**	3 (ii, iii & v)	**3.**	5 (i, iii, iv, v, viii)
4.	4D	**5.**	5		

PART - V

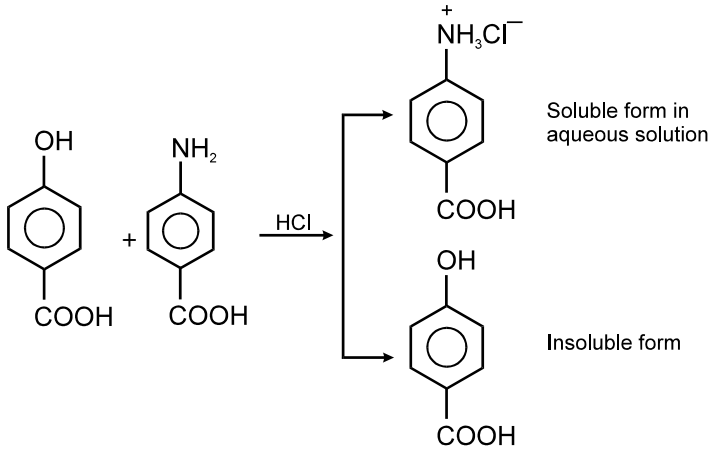
1. (A) - r ; (B) - r ; (C) - r ; (D) - r

EXERCISE – 2

PART – I

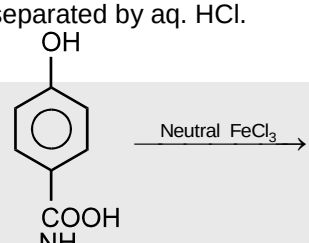
1.	(A)	**2.**	(B)	**3.**	(B)	**4.**	(A)

5.



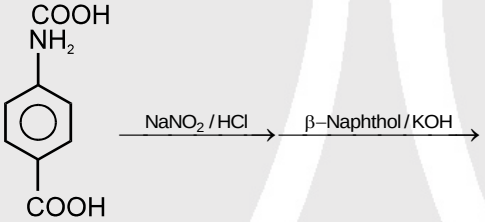
These can be separated by aq. HCl.

Test (1) :



Violet blue ppt.

Test (2) :



Red Orange dye.

6. (A) **7.** (D) **8.** (D)

9. (A) - (r, s); (B) - (p, q); (C) - (p, q, r); (D) – (p, s) **10.** 4 **11.*** (BD)

12. (D) **13.** (B)

PART – II

JEE(MAIN) OFFLINE PROBLEMS

1. (3) **2.** (4) **3.** (3) **4.** (1) **5.** (4)

6. (3) **7.** (2) **8.** (4) **9.** (2)

JEE(MAIN) ONLINE PROBLEMS

1. (3) **2.** (3) **3.** (1) **4.** (1) **5.** (4)

6. (3) **7.** (3) **8.** (3)